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[54] METAL DETECTION SYSTEM

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[52] **U.S. Cl.** **340/551**; 324/243

[58] **Field of Search** 340/572, 551, 340/825.31, 825.34; 348/142; 324/239, 243, 326–329

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[57] **ABSTRACT**

A walk-through metal detection system with split field generation coils excited in phase to generate an electromagnetic field having a substantially uniform vertical field density. A plurality of receive coils are also provided, each receive coil connected to a separate detector circuit for detecting disturbances in the generated field caused by the presence of metal objects. The signals output from the detector circuits are processed in a first embodiment to generate an output signal indicative of the total metal mass detected within the generated electromagnetic field. In a second embodiment, the signals are processed to generate an output signal indicative of the individual lumped metal mass (or masses) detected within the generated electromagnetic field. The output signal is compared to a threshold signal, and if greater than the threshold signal, then an illicit metal object is presumed to be present within the electromagnetic field and an alarm is sounded. Furthermore, the approximate vertical and/or horizontal position of the detected metal object(s) may be determined from further processing of the detector circuit outputs.

18 Claims, 6 Drawing Sheets